# A Typology of Reproducible Research: Concepts, Terms, Examples

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**slides: dh-trier.github.io/trr/**

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Universität Trier

# (1) What is Repeating Research?

# Repeating Research in Context

meta-studies

shared tasks evaluation

**repeating research**

peer-review Open Science

transparency benchmarking

# Why does Repeating Research matter?

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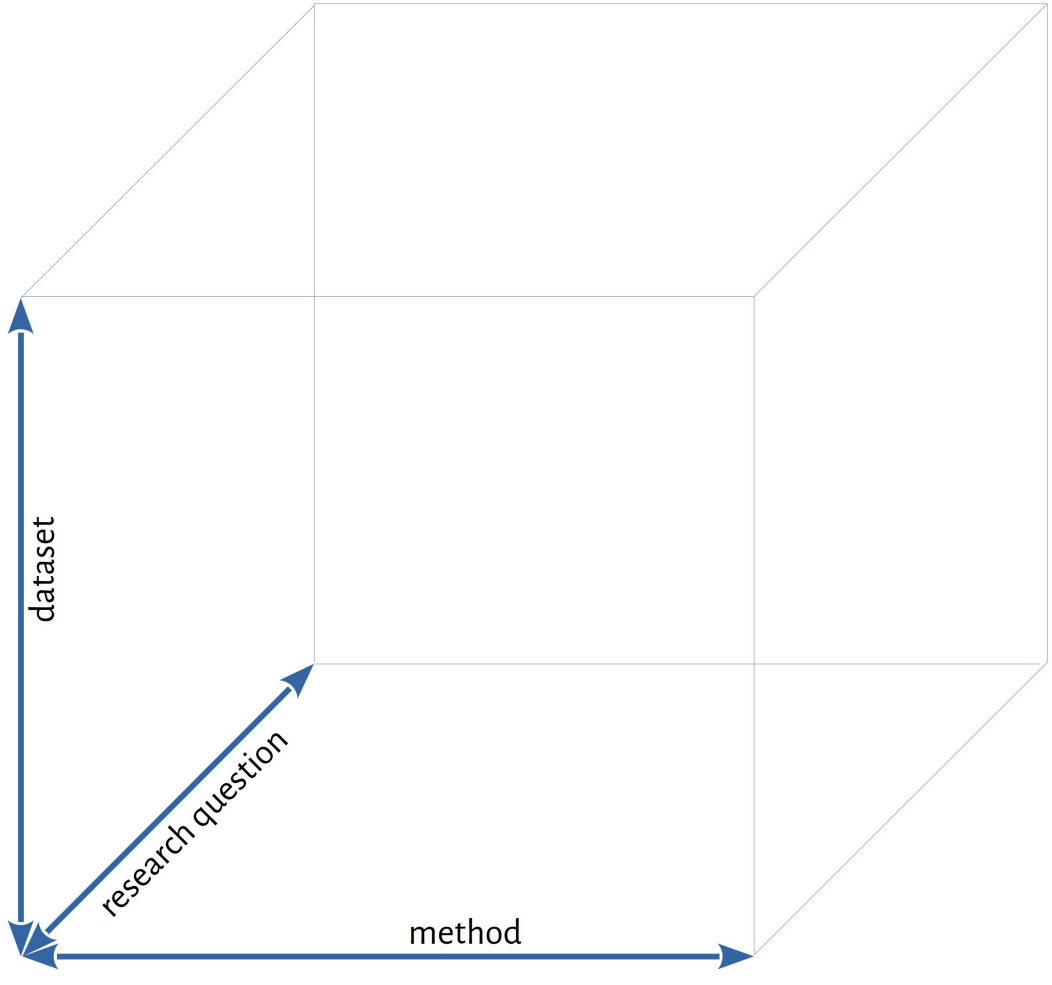
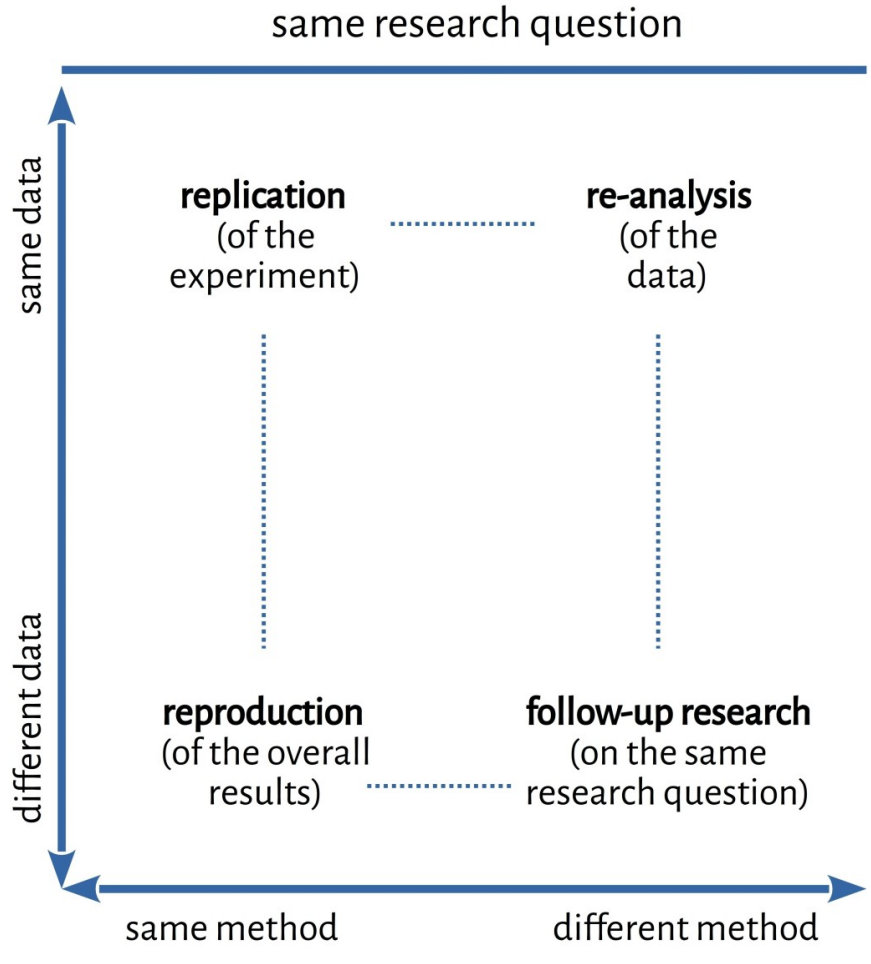
- Why is it relevant?
  - Relates to issues of trust and reliability of research
  - Relates to generalizability and robustness of research
- Why is it timely?
  - Recently, repeatability of research has come to be questioned
  - First in biomedicine and psychology
  - More recently also in ML, NLP and DH

# (2) A Typology of Repeating Research

# A 3-dimensional concept space



# Typology (same research question)



# Same method, same data

- Proposed term: replication (of the experiment)
- Function: quality check
- New knowledge: little
- Requirements: very high
  (code and data need to be available)

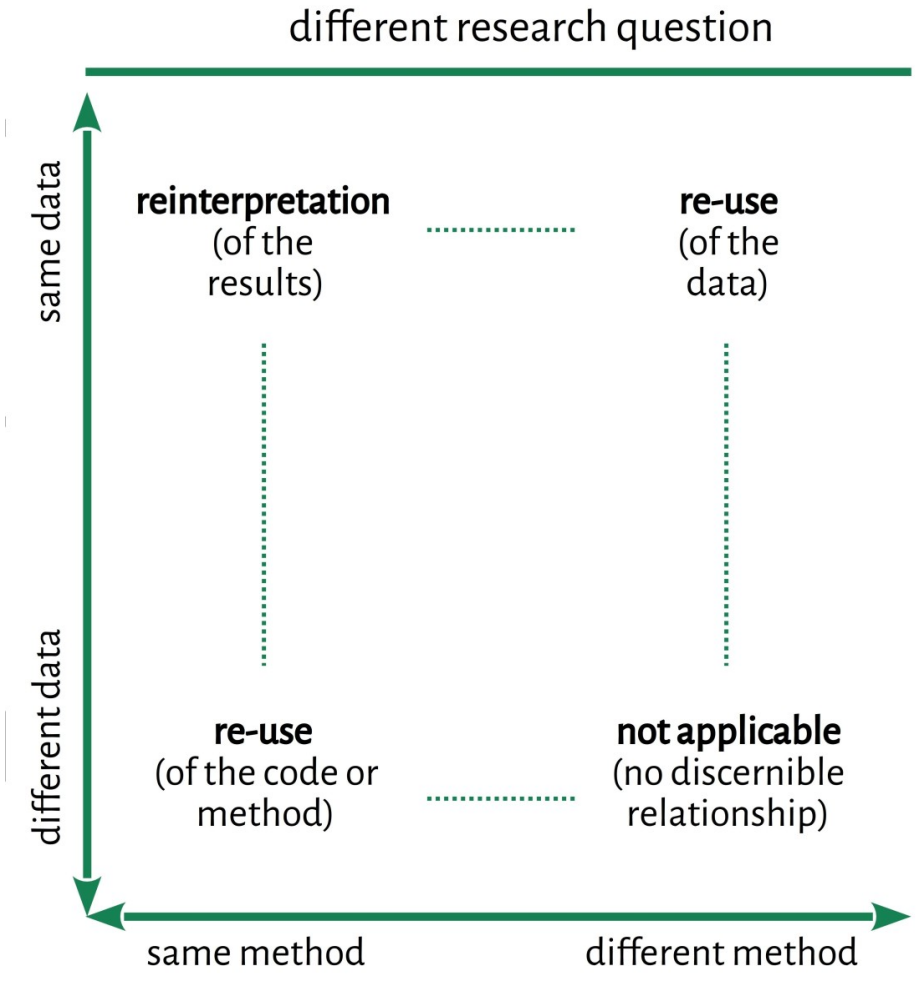
# Same method, different data

- Proposed term: reproduction (of the results)
- Function: check generalizability of method
- New knowledge: yes, supports generalization
- Requirements: high
  (code needs to be available)

# Different method, same data

- Proposed term: re-analysis (of the data)
- Function: check robustness of results
- New knowledge: yes, shows robustness
- Requirements: high
  (data needs to be available)

# Typology (different research question)



# Examples

# Example from CLS: Mendenhall

Stéfan Sinclair and Geoffrey Rockwell: Epistemologica, 2015-2019, https://github.com/sgsinclair/epistemologica/, repeating T. C. Mendenhall's "The Characteristic Curves of Composition" (1887).

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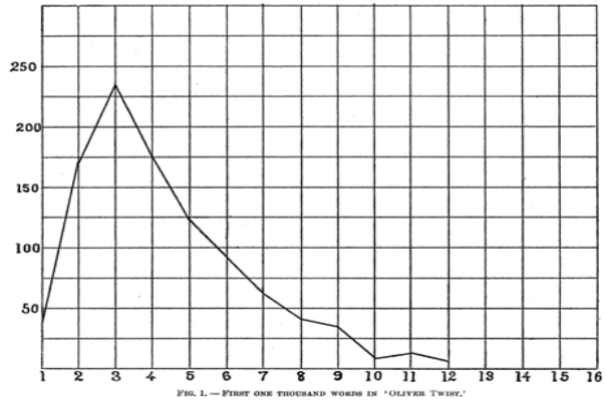

FIG. 1. — FIRST ONE THOUSAND WORDS IN 'OLIVER TWIST.'

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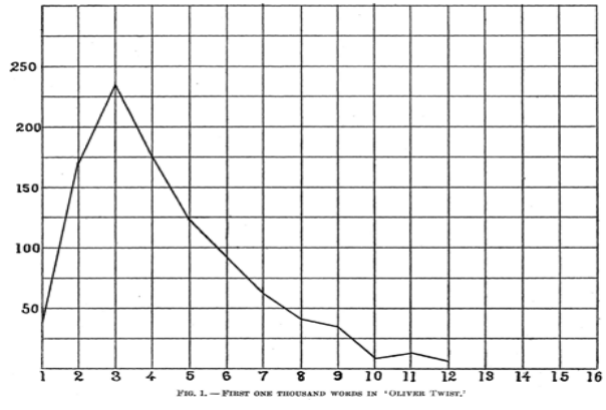

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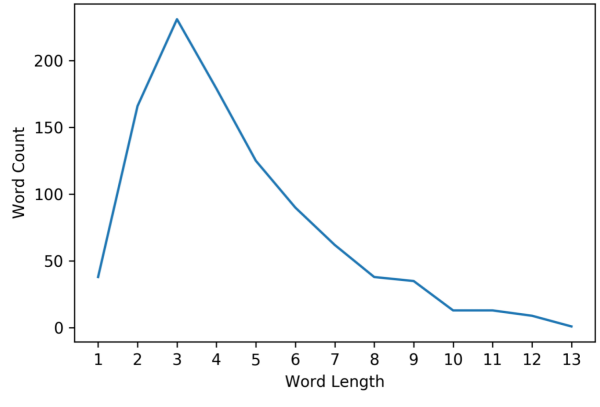


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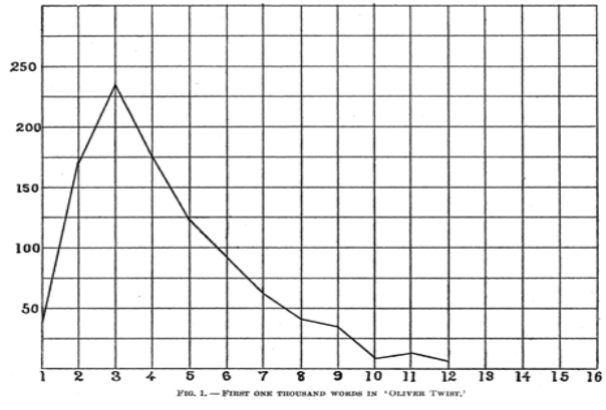

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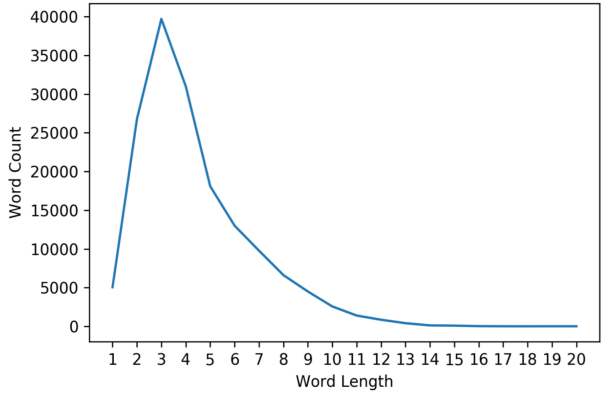


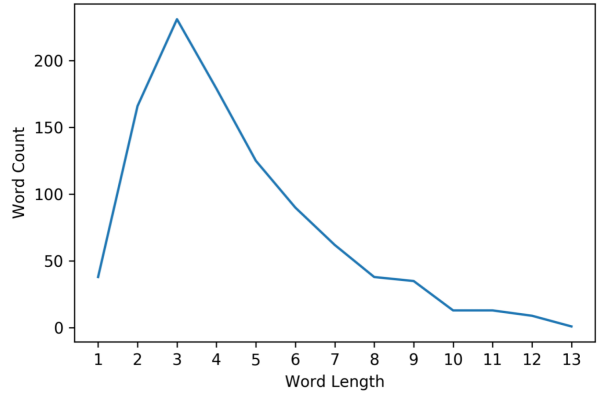


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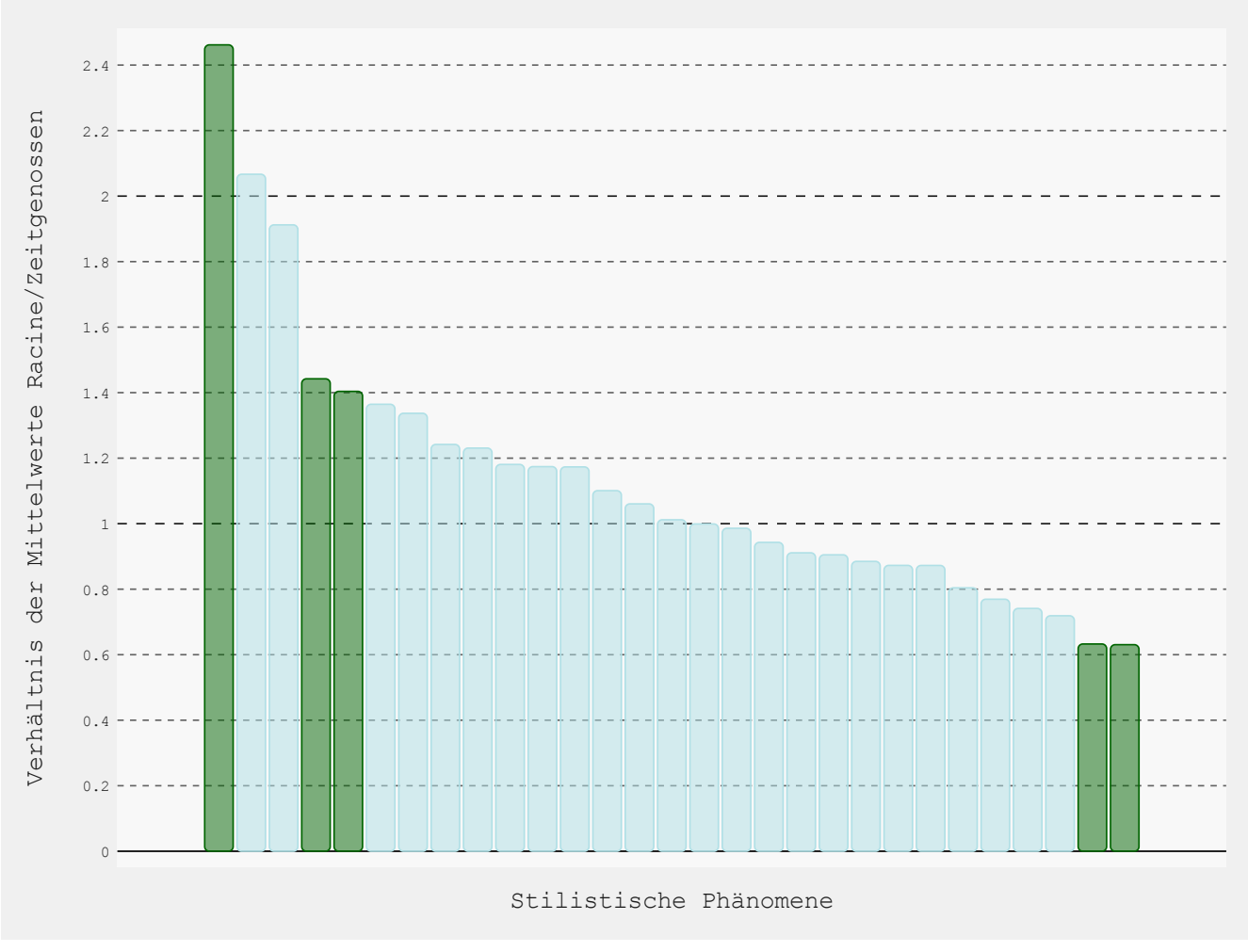
# Example from CLS: Spitzer




Schöch (2021) repeating Spitzer (1928) on Racine (17th-century)

# Conclusion

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- Strategy
  - Helps establish RR as part of DH

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- Who is concerned by RR?
  - An individual effort: routinely make code and data available
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- How to support RR?
  - Help make papers repeatable: Establish reporting standards for RR
  - Support practice of RR: Establish a RR publication category
  - Create incentives for RR: e.g. best RR paper award

# Recommended Readings


- Huber, Eva, and Çağrı Çöltekin, 'Reproduction and Replication: A Case Study with Automatic Essay Scoring', in Proceedings of the 12th Language Resources and Evaluation Conference (presented at the LREC 2020, Marseille, France: European Language Resources Association, 2020), pp. 5603–13 https://www.aclweb.org/anthology/2020.lrec-1.688 [accessed 21 February 2021]
- Peng, Roger, 'The Reproducibility Crisis in Science: A Statistical Counterattack', Significance, 12.3 (2015), 30–32 https://doi.org/10.1111/j.1740-9713.2015.00827.x
- Plesser, Hans E., 'Reproducibility vs. Replicability: A Brief History of a Confused Terminology', Frontiers in Neuroinformatics, 11 (2018) https://doi.org/10.3389/fninf.2017.00076
- Romero, Felipe, 'Philosophy of Science and the Replicability Crisis', Philosophy Compass, 14.11 (2019), e12633 https://doi.org/10.1111/phc3.12633
- Da, Nan Z., 'The Computational Case against Computational Literary Studies', Critical Inquiry, 45.3 (2019), 601–39 https://doi.org/10.1086/702594
- Open Science Collaboration, 'Estimating the Reproducibility of Psychological Science', Science, 349.6251 (2015) https://doi.org/10.1126/science.aac4716